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1. [arXiv:2212.14068](#) [[pdf](#), [other](#)] [astro-ph.IM](#) [astro-ph.SR](#) [physics.comp-ph](#)

### Web-based telluric correction made in **Spain**: spectral fitting of Vega-type telluric standards

**Authors:** [D. de la Fuente](#), [A. Marco](#), [L. R. Patrick](#), [K. Rübke](#), [I. López](#), [A. Fernández](#), [S. Conejero](#), [J. Navarro](#), [M. Palazón](#), [I. Negueruela](#)

**Abstract:** Infrared spectroscopic observations from the ground must be corrected from telluric contamination to make them ready for scientific analyses. However, telluric correction is often a tedious process that requires significant expertise to yield accurate results in a reasonable time frame. To solve these inconveniences, we present a new method for telluric correction that employs a roughly simultaneo... [▼ More](#)

**Submitted** 28 December, 2022; **originally announced** December 2022.

**Comments:** 6 pages, 2 figures. To be published in Highlights of Spanish Astrophysics XI, Proceedings of the XV Scientific Meeting of the Spanish Astronomical Society

2. [arXiv:2212.13434](#) [[pdf](#), [other](#)] [physics.soc-ph](#) [astro-ph.IM](#)

### United by skies, divided by language -- astronomy publishing in languages with small reader base

**Authors:** [Valentin D. Ivanov](#)

**Abstract:** The mysteries of the Universe are international, the skies are not crossed by borders. However, the knowledge is transmitted by language, imposing linguistic barriers that are often difficult to break through. Bulgaria is considered as an example of a country with relatively small reader base -- it has a population of about 6.5 million (2021) and the Bulgarian language has probably ~7 million... [▼ More](#)

**Submitted** 27 December, 2022; **originally announced** December 2022.

**Comments:** This is an extended write up of a poster presented at the European Week of Astronomy and Space Science (EAS) held in Valencia, **Spain**, Jun 26 -- Jul 1, 2022, Special Session 34: Diversity and Inclusion in European Astronomy (8 pages, 5 figures)

3. [arXiv:2212.12023](#) [[pdf](#), [other](#)] [hep-ph](#) [hep-th](#) [nucl-th](#)

### Proton spin, topology and confinement: lessons from QCD<sub>2</sub>

**Authors:** [David Frenklakh](#)

**Abstract:** We investigate the relation between the topology of a nucleon and its spin composition. We approach this question in (1+1) dimensional single-flavor QCD with a large number of color. In this limit the theory can be shown to be

dual to the exactly solvable sine-Gordon model. The spectrum of baryons and mesons is known analytically, and the baryon is a topological kink of the sine-Gordon model. Usin... [▼ More](#)

Submitted 22 December, 2022; **originally announced** December 2022.

**Comments:** 5 pages, 2 figures, proceedings for the XXIX International Workshop on Deep-Inelastic Scattering and Related Subjects(DIS2022, Santiago de Compostela, [Spain](#))

4. [arXiv:2212.06659](#) [[pdf](#), [other](#)] [physics.soc-ph](#)

## Digital cities and the spread of COVID-19: characterizing the impact of non-pharmaceutical interventions in five cities in [Spain](#)

**Authors:** [Jorge P. Rodríguez](#), [Alberto Aleta](#), [Yamir Moreno](#)

**Abstract:** Mathematical modeling has been fundamental to achieving near real-time accurate forecasts of the spread of COVID-19. Similarly, the design of non-pharmaceutical interventions has played a key role in the application of policies to contain the spread. However, there is less work done regarding quantitative approaches to characterize the impact of each intervention, which can greatly vary depending... [▼ More](#)

Submitted 13 December, 2022; **originally announced** December 2022.

**Comments:** Main text with 5 figures and 1 table, and Supplementary Material

5. [arXiv:2212.05313](#) [[pdf](#), [other](#)] [q-bio.PE](#)

## A compartmental model for *Xylella fastidiosa* diseases with explicit vector seasonal dynamics

**Authors:** [Àlex Giménez-Romero](#), [Eduardo Moralejo](#), [Manuel A. Matías](#)

**Abstract:** ...major outbreaks of Xf in Europe, the olive quick disease syndrome (OQDS) in Apulia, Italy, caused by the subspecies pauca, and the almond leaf scorch disease (ALSD) in Majorca, [Spain](#), caused by subspecies multiplex and fastidiosa. Using a Bayesian inference framework, we show how the model successfully reproduces the general field data in both diseases. In a... [▼ More](#)

Submitted 10 December, 2022; **originally announced** December 2022.

**Comments:** 18 pages, 8 figures

6. [arXiv:2212.04938](#) [[pdf](#), [other](#)] [q-bio.NC](#) [cs.AI](#) [cs.NE](#)

## Emergent Computations in Trained Artificial Neural Networks and Real Brains

**Authors:** [Néstor Parga](#), [Luis Serrano-Fernández](#), [Joan Falcó-Roget](#)

**Abstract:** Synaptic plasticity allows cortical circuits to learn new tasks and to adapt to changing environments. How do cortical circuits use plasticity to acquire functions such as decision-making or working memory? Neurons are connected in complex ways, forming recurrent neural networks, and learning modifies the strength of their connections. Moreover, neurons communicate emitting brief discrete electric... [▼ More](#)

Submitted 13 December, 2022; v1 submitted 9 December, 2022; **originally announced** December 2022.

**Comments:** International Summer School on Intelligent Signal Processing for Frontier Research and Industry, INFIERI 2021. Universidad Autónoma de Madrid, Madrid, [Spain](#). 23 August - 4 September 2021

7. [arXiv:2212.03503](#) [[pdf](#)] [econ.GN](#)

## The impact of CAP subsidies on the productivity of cereal farms in six European countries

**Authors:** [Luigi Biagini](#), [Federico Antonioli](#), [Simone Severini](#)

**Abstract:** ...CAP subsidies and TFP. To overcome multiple endogeneity problems, the System-GMM estimator is adopted. The investigation embraces farms in France, Germany, Italy, Poland, [Spain](#) and the United Kingdom using the FADN samples from 2008 to 2018. Adding to previous analyses, we compare results from different countries and investigate three subsets of farms with v... [▼ More](#)

Submitted 7 December, 2022; **originally announced** December 2022.

**Comments:** Working Paper May 2022

8. [arXiv:2212.02123](#) [[pdf](#), [other](#)] [astro-ph.HE](#)

## Observation of the galactic PeVatron candidate LHAASO J2108+5157 with the Large-Sized Telescope for Cherenkov Telescope Array

**Authors:** [Jakub Juryšek](#), [Matteo Balbo](#), [Dominique Eckert](#), [Andrea Tramacere](#), [Giorgio Pirola](#), [Roland Walter](#)

**Abstract:** ...observatory, sensitive from 20 GeV up to 300 TeV. The Large-Sized Telescope prototype (LST-1), currently in the commissioning phase, was inaugurated in October 2018 on La Palma ([Spain](#)). It is the first of four LST telescopes for CTA, to be built in La Palma. In 2021, LST-1 performed observations of one of the Galactic PeVatron candidates, LHAASO J2108+5157,... [▼ More](#)

Submitted 5 December, 2022; **originally announced** December 2022.

9. [arXiv:2212.00985](#) [[pdf](#), [ps](#), [other](#)] [stat.AP](#)

## A comparative analysis of several multivariate zero-inflated and zero-modified models with applications in insurance

Authors: [Pengcheng Zhang](#), [David Pitt](#), [Xueyuan Wu](#)

**Abstract:** ...comparative analysis of several models under these two frameworks is conducted using the data of an automobile insurance portfolio from a major insurance company in **Spain**. A less common situation in insurance is the absence of some common zeros resulting from incomplete records. This feature of these data is known as multivariate zero-deflation. In this case... [▼ More](#)

Submitted 2 December, 2022; **originally announced** December 2022.

10. [arXiv:2211.13214](#) [[pdf](#)] [astro-ph.IM](#) [doi](#) [10.1117/12.2626105](#)

## Costs and benefits of automation for astronomical facilities

Authors: [A. Yanes-Díaz](#), [S. Rueda-Teruel](#), [R. Bello](#), [D. Lozano-Pérez](#), [M. Royo-Navarro](#), [T. Civera](#), [M. Domínguez-Martínez](#), [N. Martínez-Olivar](#), [S. Chueca](#), [C. Iñiguez](#), [A. Marin-Franch](#), [F. Rueda-Teruel](#), [G. López-Alegre](#), [S. Bielsa](#), [J. Muñoz-Maudos](#), [H. Rueda-Asensio](#), [A. Muñoz-Teruel](#), [D. Garcés-Cubel](#), [I. Soriano-Laguía](#), [M. Almarcegui-Gracia](#), [A. J. Cenarro](#), [M. Moles](#), [D. Cristobal-Hornillos](#), [J. Varela](#), [A. Ederoclite](#), et al. (35 additional authors not shown)

**Abstract:** The Observatorio Astrofísico de Javalambre (OAJ†1) in **Spain** is a young astronomical facility, conceived and developed from the beginning as a fully automated observatory with the main goal of optimizing the processes in the scientific and general operation of the Observatory. The OAJ has been particularly conceived for carrying out large sky surveys with two... [▼ More](#)

Submitted 24 November, 2022; v1 submitted 23 November, 2022; **originally announced** November 2022.

Comments: Global Observatory Control System GOCS

Journal ref: Proceedings Volume 12186, Observatory Operations: Strategies, Processes, and Systems IX; 121860Y (2022)

11. [arXiv:2211.10784](#) [[pdf](#), [other](#)] [stat.ME](#) [stat.AP](#)

## Model-based tools for assessing space and time change in daily maximum temperature: an application to the Ebro basin in **Spain**

Authors: [Ana C. Cebrián](#), [Jesús Asín](#), [Jorge Castillo-Mateo](#), [Alan E. Gelfand](#), [Jesús Abaurrea](#)

**Abstract:** ...suitable model fitted to any set of spatially referenced time series data. As an illustration, we employ a dataset from 1956 to 2015 collected at 18 stations over Aragón in **Spain**, and a collection of daily maximum temperature series obtained from posterior predictive simulation of a Bayesian hierarchical daily temperature model. The results for the summer... [▼ More](#)

Submitted 19 November, 2022; **originally announced** November 2022.

Comments: 23 pages main manuscript and 7 pages supplement

12. [arXiv:2211.08995](#) [[pdf](#), [other](#)] [econ.EM](#)

## Estimating Dynamic Spillover Effects along Multiple Networks in a Linear Panel Model

Authors: [Clemens Possnig](#), [Andreea Rotărescu](#), [Kyungchul Song](#)

**Abstract:** ...methodology developed here, we perform an empirical study of spillovers between bank weakness and zombie-firm congestion in industrial sectors, using firm-bank matched data from **Spain** between 2005 and 2012. Overall, we find that there is positive spillover in both directions between banks and sectors. [▼ More](#)

Submitted 16 November, 2022; **originally announced** November 2022.

13. [arXiv:2211.08456](#) [[pdf](#), [other](#)] [physics.soc-ph](#)

## Microscopic dynamics at the Running of the Bulls (San Fermin Festival) in the context of the Social Force Model

Authors: [F. E. Cornes](#), [G. A. Frank](#), [C. O. Dorso](#)

**Abstract:** This research explores the dynamics of the emergency evacuation during the "Running of the Bulls" festival (**Spain**, 2013). As people run to escape from danger, many pedestrians stumble and fall down, while others will try to pass over them. We carefully examined three specific recordings of the running, that show this kind of behavior. We developed a... [▼ More](#)

Submitted 15 November, 2022; **originally announced** November 2022.

14. [arXiv:2211.07420](#) [[pdf](#)] [physics.soc-ph](#) [math-ph](#)

## Machine learning for the prediction of voter model opinions through complex network structures

**Authors:** [Aruane M. Pineda](#), [Caroline L. Alves](#), [Colm Connaughton](#), [Francisco A. Rodrigues](#)

**Abstract:** The inference of outcomes in dynamic processes from structural features of systems is a crucial endeavor in network science. Recent research has suggested a machine learning-based approach for the interpretation of dynamic patterns emerging in complex network systems. The hypothesis is applied in this study towards showing opinions can be classified in the voter model with the use of topological f... [▼ More](#)

**Submitted** 14 November, 2022; **originally announced** November 2022.

**Comments:** Proc. of the Interdisciplinary Conference on Mechanics, Computers and Electrics (ICMECE 2022) 6-7 October 2022, Barcelona, [Spain](#)

15. [arXiv:2211.04755](#) [[pdf](#), [other](#)] [cs.CV](#) [cs.AI](#) [cs.LG](#)

### Towards Global Crop Maps with Transfer Learning

**Authors:** [Hyun-Woo Jo](#), [Alkiviadis Koukos](#), [Vasileios Sitokonstantinou](#), [Woo-Kyun Lee](#), [Charalampos Kontoes](#)

**Abstract:** ...and trained a deep learning model for paddy rice detection in South Korea using Sentinel-1 VH time-series. We then fine-tune the model for i) paddy rice detection in France and [Spain](#) and ii) barley detection in the Netherlands. Additionally, we propose a modification in the pre-trained weights in order to incorporate extra input features (Sentinel-1 VV). Our... [▼ More](#)

**Submitted** 10 November, 2022; **v1** submitted 9 November, 2022; **originally announced** November 2022.

**Comments:** Accepted for publication at Tackling Climate Change with Machine Learning: workshop at NeurIPS 2022

16. [arXiv:2211.02785](#) [[pdf](#), [other](#)] [hep-ph](#) [hep-ex](#) [nucl-ex](#) [nucl-th](#)

### The Electron-Ion Collider -- A U.S. facility for the European community to explore the mysteries of the building blocks of matter

**Authors:** [Marco Radici](#), [Silvia Dalla Torre](#), [Daria Sokhan](#)

**Abstract:** ...based in 80 institutions (30% of the total) located in Armenia, Czech Republic, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Netherlands, Norway, Poland, Slovenia, [Spain](#), Sweden, Switzerland, Ukraine, and the United Kingdom. This European involvement is an important driver of the EIC, but can also be beneficial for a number of related ongoing a... [▼ More](#)

**Submitted** 4 November, 2022; **originally announced** November 2022.

**Comments:** adapted from original document submitted to NuPECC; 5 pages (limited by NuPECC) plus front matter plus references

17. [arXiv:2211.02351](#) [[pdf](#)] [eess.SY](#) [cs.CY](#)

### Management and Detection System for Medical Surgical Equipment

**Authors:** [Alexandra Hadar](#), [Natan Levy](#), [Michael Winokur](#)

**Abstract:** Retained surgical bodies (RSB) are any foreign bodies left inside the patient after a medical procedure. RSB is often caused by human mistakes or miscommunication between medical staff during the procedure. Infection, medical complications, and even death are possible consequences of RSB, and it is a significant risk for patients, hospitals, and surgical staff. In this paper, we describe the engin... [▼ More](#)

**Submitted** 4 November, 2022; **originally announced** November 2022.

**Journal ref:** Proc. of the Interdisciplinary Conference on Mechanics, Computers and Electrics (ICMECE 2022) 6-7 October 2022, Barcelona, [Spain](#)

18. [arXiv:2211.02040](#) [[pdf](#)] [physics.soc-ph](#)

### Barcelona, The Innovation District: between vulnerability and social equity

**Authors:** [P. Ballester](#)

**Abstract:** ...of the poorest and most marginalized districts of the city while having as identity the expression of "Manchester southern Europe", recalling its role as a factory for [Spain](#) and an emblem of the Industrial Revolution for the Iberian Peninsula. Conceptualization, programming and construction of a new image of the city through this large urban wastelan... [▼ More](#)

**Submitted** 2 November, 2022; **originally announced** November 2022.

**Comments:** in French language

**Journal ref:** Sous la direction de Yvette Lazzeri et Emmanuel Moustier. Vulnérabilités, résilience et activités en Méditerranée, 4. Pôles Développement Durable et Territoires Méditerranéens (Chapitre 11), PUAM, pp.175-182, 2012, 9782853998550

19. [arXiv:2211.01091](#) [[pdf](#), [ps](#), [other](#)] [eess.AS](#) [cs.AI](#) [cs.SD](#)

### I4U System Description for NIST SRE'20 CTS Challenge

**Authors:** Kong Aik Lee, Tomi Kinnunen, Daniele Colibro, Claudio Vair, Andreas Nautsch, Hanwu Sun, Liang He, Tianyu Liang, Qiongqiong Wang, Mickael Rouvier, Pierre-Michel Bousquet, Rohan Kumar Das, Ignacio Viñals Bailo, Meng Liu, Héctor Deldago, Xuechen Liu, Md Sahidullah, Sandro Cumani, Boning Zhang, Koji Okabe, Hitoshi Yamamoto, Ruijie Tao, Haizhou Li, Alfonso Ortega Giménez, Longbiao Wang, et al. (1 additional authors not shown)

**Abstract:** ...R (Singapore), UEF (Finland), VALPT (Italy, **Spain**), NEC (Japan), THUÉE (China), LIA (France), NUS (Singapore), INRIA (France) and TJU (China). The submission was based on the fusion of top performing sub-systems and sub-fusion systems contributed by individual teams. Efforts have been spent on the use of common development and validation sets, submission sch... [▼ More](#)

**Submitted** 2 November, 2022; **originally announced** November 2022.

**Comments:** SRE 2021, NIST Speaker Recognition Evaluation Workshop, CTS Speaker Recognition Challenge, 14-12 December 2021

20. [arXiv:2210.16049](#) [[pdf](#), [other](#)] [cs.LG](#) [cs.AI](#) [stat.ML](#)

## Measuring the Confidence of Traffic Forecasting Models: Techniques, Experimental Comparison and Guidelines towards Their Actionability

**Authors:** Ibai Laña, Ignacio, Olabarrieta, Javier Del Ser

**Abstract:** ...this critical discussion is further informed by experimental results produced by different uncertainty estimation techniques over real traffic data collected in Madrid (**Spain**), rendering a general overview of the benefits and caveats of every technique, how they can be compared to each other, and how the measured uncertainty decreases depending on the amoun... [▼ More](#)

**Submitted** 28 October, 2022; **originally announced** October 2022.

**Comments:** 46 pages, 12 figures, under review

21. [arXiv:2210.14997](#) [[pdf](#), [other](#)] [cs.RO](#) [cs.CV](#)

## LiDAR-guided object search and detection in Subterranean Environments

**Authors:** Manthan Patel, Gabriel Waibel, Shehryar Khattak, Marco Hutter

**Abstract:** Detecting objects of interest, such as human survivors, safety equipment, and structure access points, is critical to any search-and-rescue operation. Robots deployed for such time-sensitive efforts rely on their onboard sensors to perform their designated tasks. However, as disaster response operations are predominantly conducted under perceptually degraded conditions, commonly utilized sensors s... [▼ More](#)

**Submitted** 26 October, 2022; **originally announced** October 2022.

**Comments:** 6 pages, 5 Figures, 2 Tables, conference: IEEE International Symposium on Safety, Security and Rescue Robotics (SSRR-2022), Seville, **Spain**

22. [arXiv:2210.13360](#) [[pdf](#)] [physics.ed-ph](#) [astro-ph.IM](#) [doi](#) [10.4995/HEAD22.2022.14440](#)

## Hands-on learning at a world-class telescope

**Authors:** Elisabeta Lusso, Lapo Casetti, Maurizio Pancrazzi, Marco Romoli

**Abstract:** ...and collaboration. In this paper we present the results of an observing campaign carried out at the Telescopio Nazionale Galileo (TNG) located in La Palma (Canary Islands, **Spain**) by undergraduate students of the Department of Physics and Astronomy, at the University of Firenze. [▼ More](#)

**Submitted** 24 October, 2022; **originally announced** October 2022.

**Comments:** 8 pages, 3 figures, proceedings of the 8th International Conference on Higher Education Advances (HEAD'22)

23. [arXiv:2210.13322](#) [[pdf](#), [other](#)] [physics.soc-ph](#)

## On the heterogeneity of urban expansion profiles in Europe

**Authors:** Paul Kilgariff, Remi Lemoy, Geoffrey Caruso

**Abstract:** ...Results highlight the level of heterogeneity between cities. Removing water, we can see that the cities with the highest levels of water have a higher level of ALU on average. **Spain** and France are found to have contrasting levels of ALU, Spanish cities having below average ALU and France above average. Using seriation techniques enables us to group and orde... [▼ More](#)

**Submitted** 24 October, 2022; **originally announced** October 2022.

**Comments:** 33 pages, 11 figures

24. [arXiv:2210.13074](#) [[pdf](#), [other](#)] [astro-ph.IM](#) [astro-ph.HE](#)

## Radiation of ionization electrons: the key role of their 2-pt function of velocities

**Authors:** Olivier Deligny

**Abstract:** Several attempts to detect extensive air showers (EAS) induced by ultra-high energy cosmic rays have been conducted in the last decade based on the molecular Bremsstrahlung radiation (MBR) at GHz frequencies from quasi-

elastic collisions of ionisation electrons left in the atmosphere after the passage of the cascade of particles. These attempts have led to the detection of a handful of signals onl... [▼ More](#)

**Submitted** 24 October, 2022; **originally announced** October 2022.

**Comments:** Proceedings of the 9th International Workshop on Acoustic and Radio EeV Neutrino Detection Activities - ARENA2022 - June 7-10, 2022, Santiago de Compostela, **Spain** - to appear in Proceedings of Science

25. [arXiv:2210.11517](#) [[pdf](#), [other](#)] cs.CR

## A Security and Trust Framework for Decentralized 5G Marketplaces

**Authors:** [José María Jorquera Valero](#), [Manuel Gil Pérez](#), [Gregorio Martínez Pérez](#)

**Abstract:** 5G networks intend to cover user demands through multi-party collaborations in a secure and trustworthy manner. To this end, marketplaces play a pivotal role as enablers for network service consumers and infrastructure providers to offer, negotiate, and purchase 5G resources and services. Nevertheless, marketplaces often do not ensure trustworthy networking by analyzing the security and trust of t... [▼ More](#)

**Submitted** 20 October, 2022; **originally announced** October 2022.

**Journal ref:** Proceedings of the VII Jornadas Nacionales de Investigación en Ciberseguridad, pp. 237-240, Bilbao, **Spain** (2022)

26. [arXiv:2210.04064](#) [[pdf](#), [other](#)] cs.CR

## Study and security analysis of the Spanish identity card

**Authors:** [Javier Correa-Marichal](#), [Pino Caballero-Gil](#), [Carlos Rosa-Remedios](#), [Rames Sarwat-Shaker](#)

**Abstract:** ...is a fundamental piece of documentation for the identification of citizens throughout the world. That is precisely the case of the DNI (Documento Nacional de Identidad) of **Spain**. Its importance has been enhanced in recent years with the addition of a chip for the authentication of users within telematic administrative services. Thus, the document has since b... [▼ More](#)

**Submitted** 8 October, 2022; **originally announced** October 2022.

**Journal ref:** World Congress in Computer Science, Computer Engineering, and Applied Computing. Book of Abstracts CSCE 22. American Council on Science and Education. 2022

27. [arXiv:2210.03388](#) [[pdf](#), [other](#)] cs.SE

## Towards Automatic Model Completion: from Requirements to SysML State Machines

**Authors:** [Maria Stella de Biase](#), [Stefano Marrone](#), [Angelo Palladino](#)

**Abstract:** Even if model-driven techniques have been enabled the centrality of the models in automated development processes, the majority of the industrial settings does not embrace such a paradigm due to the procedural complexity of managing model life cycle. This paper proposes a semi-automatic approach for the completion of high-level models of critical systems. The proposal suggests a specification guid... [▼ More](#)

**Submitted** 7 October, 2022; **originally announced** October 2022.

**Comments:** Editor: Ibéria Medeiros. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, **Spain**. Student Forum Proceedings - EDCC 2022

28. [arXiv:2210.03020](#) [[pdf](#), [other](#)] cs.CR

## Model-Driven Engineering for Formal Verification and Security Testing of Authentication Protocols

**Authors:** [Mariapia Raimondo](#), [Stefano Marrone](#), [Angelo Palladino](#)

**Abstract:** Even if the verification of authentication protocols can be achieved by means of formal analysis, the modelling of such an activity is an error-prone task due to the lack of automated and integrated processes. This paper proposes a comprehensive approach, based on the Unified Modeling Language (UML) profiling technique and on model-transformation, to enable automatic analysis of authentication pro... [▼ More](#)

**Submitted** 6 October, 2022; **originally announced** October 2022.

**Comments:** Editor: Ibéria Medeiros. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, **Spain**. Student Forum Proceedings - EDCC 2022

29. [arXiv:2210.02451](#) [[pdf](#)] q-bio.QM

## Morpho-anatomical characterization of the urogenital schistosomiasis vector *Bulinus truncatus* (Audouin, 1827) (Heterobranchia : Bulinidae) from Southwestern Europe

**Authors:** [Alberto Martínez-Ortí](#), [Sonia Adam](#), [Giovanni Garippa](#), [Jérôme Boissier](#), [M Dolores Bargues](#), [Santiago Mas-Coma](#)

**Abstract:** ...Europe since the beginning of the 20 th century and nowadays its presence is also known, at least imported by Sub-Saharan emigrants and tourists, in France, Italy, Portugal and **Spain**. One of the intermediate hosts of this trematode present in Europe is the bulinid mollusc *Bulinus truncatus*, non-native species that can be reached to Europe by humans and birds... [▼ More](#)

Submitted 5 October, 2022; originally announced October 2022.

Journal ref: Journal of Conchology, CONCHOLOGICAL SOC GREAT BRITAIN & IRELAND 2022, 44 (4), pp.355-372

30. [arXiv:2210.00134](#) [[pdf](#), [other](#)] [cs.DC](#)

## Towards Implementing ML-Based Failure Detectors

Authors: [Xiaonan Li](#), [Olivier Marin](#)

**Abstract:** Most existing failure detection algorithms rely on statistical methods, and very few use machine learning (ML). This paper explores the viability of ML in the field of failure detection: is it possible to implement an ML-based detector that achieves a satisfactory quality of service? We implement a prototype that uses a basic long short-term memory neural network algorithm, and study its behavior... [▽ More](#)

Submitted 30 September, 2022; originally announced October 2022.

Comments: 4 pages, 3 figures Editor: Ibéria Medeiros. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, [Spain](#). Student Forum Proceedings - EDCC 2022

31. [arXiv:2209.15444](#) [[pdf](#)] [physics.hist-ph](#) [astro-ph.IM](#) [doi](#) [10.31527/analesafa.2020.31.3.93](#)

## La orientación de las iglesias coloniales de Fuerteventura

Authors: [Maria Florencia Muratore](#), [Alejandro Gangui](#)

**Abstract:** ...Christian churches. We present preliminary results of the analysis of the precise spatial orientation of nearly fifty chapels and churches of the Canary Island of Fuerteventura ([Spain](#)), most of them built from the period of the Norman conquest in the fifteenth century to the nineteenth century. Although some small chapels belonging to the manorial power of t... [▽ More](#)

Submitted 29 September, 2022; originally announced September 2022.

Comments: Article in Spanish including 6 figures and 1 table

Journal ref: Anales AFA 31:93-100, 2020

32. [arXiv:2209.15424](#) [[pdf](#), [other](#)] [physics.ao-ph](#) [cs.AI](#) [cs.LG](#)

## Accurate Long-term Air Temperature Prediction with a Fusion of Artificial Intelligence and Data Reduction Techniques

Authors: [Dušan Fister](#), [Jorge Pérez-Aracil](#), [César Peláez-Rodríguez](#), [Javier Del Ser](#), [Sancho Salcedo-Sanz](#)

**Abstract:** ...prediction of average air temperature in the first and second August fortnights, using input data from previous months, at two different locations, Paris (France) and Córdoba ([Spain](#)), is considered. The target variable, mainly in the first August fortnight, can contain signals of extreme events such as heatwaves, like the mega-heatwave of 2003, which affecte... [▽ More](#)

Submitted 29 September, 2022; originally announced September 2022.

Comments: 33 pages, 14 figures, 7 tables, under review

MSC Class: 68T07; 62P12; 68T01; 68T05

33. [arXiv:2209.14489](#) [[pdf](#), [other](#)] [hep-ph](#) [hep-ex](#)

## Reconstruction of event kinematics in semi-inclusive deep-inelastic scattering using the hadronic final state and Machine Learning

Authors: [Connor Pecar](#), [Anselm Vossen](#)

**Abstract:** Semi-inclusive deep-inelastic scattering (SIDIS) at the Electron-Ion Collider will allow for precise mapping of the 3D momentum and spin structure of nucleons and nuclei over a large kinematic region. In this contribution, we demonstrate methods utilizing the hadronic final state and scattered electron, as well as machine learning, to more reliably reconstruct the virtual photon four momentum and... [▽ More](#)

Submitted 4 October, 2022; v1 submitted 28 September, 2022; originally announced September 2022.

Journal ref: Presented at DIS2022: XXIX International Workshop on Deep-Inelastic Scattering and Related Subjects, Santiago de Compostela, [Spain](#), May 2-6 2022

34. [arXiv:2209.14113](#) [[pdf](#), [other](#)] [astro-ph.IM](#) [hep-ex](#) [physics.ins-det](#) [doi](#) [10.1088/1475-7516/2022/11/048](#)

## Improving ANAIS-112 sensitivity to DAMA/LIBRA signal with machine learning techniques

Authors: [I. Coarasa](#), [J. Apilluelo](#), [J. Amaré](#), [S. Cebrián](#), [D. Cintas](#), [E. García](#), [M. Martínez](#), [M. A. Oliván](#), [Y. Ortigoza](#), [A. Ortiz de Solórzano](#), [T. Pardo](#), [J. Puimedón](#), [A. Salinas](#), [M. L. Sarsa](#), [P. Villar](#)

**Abstract:** ...material, NaI(Tl), removes the dependence on the particle and halo models and is the goal of the ANAIS-112 experiment, taking data at the Canfranc Underground Laboratory in [Spain](#) since August 2017 with 112.5 kg of NaI(Tl). At very low energies, the detection rate is dominated by non-bulk scintillation events and careful event selection is mandatory. This art... [▽ More](#)

35. [arXiv:2209.14071](#) [[pdf](#), [other](#)] [cs.SE](#)

## Towards Auditable Distributed Systems

Authors: [Lev Sorokin](#)

**Abstract:** The emerging trend towards distributed (cloud) systems (DS) has widely arrived whether in the automotive, public or the financial sector, but the execution of services of heterogeneous service providers is exposed to several risks. Beside hardware/software faults or cyber attacks that can influence the correctness of the system, fraud is also an issue. In such case it is not only important to veri... [▽ More](#)

Submitted 28 September, 2022; originally announced September 2022.

**Comments:** Editor: Ibéria Medeiros. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, [Spain](#). Student Forum Proceedings - EDCC 2022

36. [arXiv:2209.14049](#) [[pdf](#), [other](#)] [cs.AI](#) [cs.DB](#) [cs.DL](#)

## Popularity Driven Data Integration

Authors: [Fausto Giunchiglia](#), [Simone Bocca](#), [Mattia Fumagalli](#), [Mayukh Bagchi](#), [Alessio Zamboni](#)

**Abstract:** More and more, with the growing focus on large scale analytics, we are confronted with the need of integrating data from multiple sources. The problem is that these data are impossible to reuse as-is. The net result is high cost, with the further drawback that the resulting integrated data will again be hardly reusable as-is. iTelos is a general purpose methodology aiming at minimizing the effects... [▽ More](#)

Submitted 28 September, 2022; originally announced September 2022.

**Comments:** KGSWC 2022. Fourth Ibero-American Knowledge Graph and Semantic Web Conference joint with Third Indo-American Knowledge Graph and Semantic Web Conference 21-23 November 2022, Universidad Camilo José Cela, Madrid, [Spain](#). arXiv admin note: substantial text overlap with arXiv:2105.09418

37. [arXiv:2209.13411](#) [[pdf](#), [other](#)] [cs.LG](#)

## Is your forecaster smarter than an energy engineer: a deep dive into electricity price forecasting

Authors: [Maria Margarida Mascarenhas](#), [Hussain Kazmi](#)

**Abstract:** The field of electricity price forecasting has seen significant advances in the last years, including the development of new, more accurate forecast models. These models leverage statistical relationships in previously observed data to predict the future; however, there is a lack of analysis explaining these models, which limits their real world applicability in critical infrastructure. In this pa... [▽ More](#)

Submitted 22 September, 2022; originally announced September 2022.

**Comments:** Editor: Geert Deconinck. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, [Spain](#). Fast Abstract Proceedings - EDCC 2022

38. [arXiv:2209.10970](#) [[pdf](#), [other](#)] [cs.SD](#) [cs.CG](#) [eess.AS](#)

## Maths, Computation and Flamenco: overview and challenges

Authors: [José-Miguel Díaz-Báñez](#), [Nadine Kroher](#)

**Abstract:** Flamenco is a rich performance-oriented art music genre from Southern [Spain](#) which attracts a growing community of aficionados around the globe. Due to its improvisational and expressive nature, its unique musical characteristics, and the fact that the genre is largely undocumented, flamenco poses a number of interesting mathematical and computational challen... [▽ More](#)

Submitted 22 September, 2022; originally announced September 2022.

39. [arXiv:2209.09990](#) [[pdf](#), [other](#)] [hep-ex](#) [nucl-ex](#)

## Quarkonia production in (ultra-)peripheral PbPb collisions at LHCb

Authors: [Xiaolin Wang](#)

**Abstract:** The cross-sections of coherent  $\Upsilon$  and  $\Upsilon$  production in ultra-peripheral PbPb collisions at a nucleon-nucleon center-of-mass energy of 5.02 TeV are measured using a data sample collected in 2018 at  $\sqrt{s_{NN}} = 5.02$  TeV, and the differential cross-sections are measured separately as a function of transverse momentum and rapidity. The photo-production of  $\Upsilon$  mesons at low transverse momentu... [▽ More](#)

Submitted 20 September, 2022; originally announced September 2022.

**Comments:** Presented at DIS2022: XXIX International Workshop on Deep-Inelastic Scattering and Related Subjects, Santiago de Compostela, [Spain](#), May 2-6 2022

40. [arXiv:2209.09610](#) [[pdf](#), [other](#)] [eess.IV](#) [cs.CV](#)

## Generalisability of deep learning models in low-resource imaging settings: A fetal ultrasound study in 5 African countries

**Authors:** [Carla Sendra-Balcells](#), [Victor M. Campello](#), [Jordina Torrents-Barrena](#), [Yahya Ali Ahmed](#), [Mustafa Elattar](#), [Benard Ohene Botwe](#), [Pempho Nyangulu](#), [William Stones](#), [Mohammed Ammar](#), [Lamya Nawal Benamer](#), [Harriet Nalubega Kisebo](#), [Senai Goitom Sereke](#), [Sikolia Z. Wanyonyi](#), [Marleen Temmerman](#), [Kamil Mikolaj](#), [Martin Grønnebak Tolsgaard](#), [Karim Lekadir](#)

**Abstract:** ...plane classification model trained on a high-resource clinical centre and transferred to a new low-resource centre. To that end, a classifier trained with 1,792 patients from **Spain** is first evaluated on a new centre in Denmark in optimal conditions with 1,008 patients and is later optimised to reach the same performance in five African centres (Egypt, Algeri... [▽ More](#)

Submitted 20 September, 2022; **originally announced** September 2022.

41. [arXiv:2209.09001](#) [[pdf](#), [other](#)] [cs.PF](#)

### Exploring the Effects of Multicast Communication on DDS Performance

**Authors:** [Kaleem Peeroo](#), [Peter Popov](#), [Vladimir Stankovic](#)

**Abstract:** The Data Distribution Service (DDS) is an Object Management Group (OMG) standard for high-performance and real-time systems. DDS is a data-centric middleware based on the publish-subscribe communication pattern and is used in many mission-critical, or even safety-critical, systems such as air traffic control and robot operating system (ROS2). This research aims at identifying how the usage of mu... [▽ More](#)

Submitted 19 September, 2022; **originally announced** September 2022.

**Comments:** 4 pages, 2 tables, 3 figures, and presented at EDCC 2022 (European Dependable Computing Conference). Editor: Ibéria Medeiros. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, **Spain**. Student Forum Proceedings - EDCC 2022

42. [arXiv:2209.08879](#) [[pdf](#), [other](#)] [cs.DB](#)

### Scalable data storage for PV monitoring systems

**Authors:** [Anastasios Kladas](#), [Bert Herteleer](#), [Jan Cappelle](#)

**Abstract:** Efficient PV research which includes a prolonged data monitoring from multiple experiments with different characteristics, requires a scalable supporting system to handle all of the collected information. This paper presents the development of a relational database for hosting all the necessary information for data modeling, comparative analysis and O&M systems. Ramer-Douglas-Peucker algorithm an... [▽ More](#)

Submitted 19 September, 2022; **originally announced** September 2022.

**Comments:** Editor: Geert Deconinck. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, **Spain**. Fast Abstract Proceedings - EDCC 2022

43. [arXiv:2209.08099](#) [[pdf](#)] [cs.LG](#) [cs.AI](#) [eess.SY](#)

### Anomaly Detection in Automatic Generation Control Systems Based on Traffic Pattern Analysis and Deep Transfer Learning

**Authors:** [Tohid Behdadnia](#), [Geert Deconinck](#)

**Abstract:** In modern highly interconnected power grids, automatic generation control (AGC) is crucial in maintaining the stability of the power grid. The dependence of the AGC system on the information and communications technology (ICT) system makes it vulnerable to various types of cyber-attacks. Thus, information flow (IF) analysis and anomaly detection became paramount for preventing cyber attackers from... [▽ More](#)

Submitted 16 September, 2022; **originally announced** September 2022.

**Comments:** Editor: Geert Deconinck. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, **Spain**. Fast Abstract Proceedings - EDCC 2022

44. [arXiv:2209.07273](#) [[pdf](#), [other](#)] [physics.ins-det](#) [hep-ex](#)

### Development of Ultra-pure Gadolinium Sulfate for the Super-Kamiokande Gadolinium Project

**Authors:** [K. Hosokawa](#), [M. Ikeda](#), [T. Okada](#), [H. Sekiya](#), [P. Fernandez](#), [L. Labarga](#), [I. Bandac](#), [J. Perez](#), [S. Ito](#), [M. Harada](#), [Y. Koshio](#), [M. D. Thiesse](#), [L. F. Thompson](#), [P. R. Scovell](#), [E. Meehan](#), [K. Ichimura](#), [Y. Kishimoto](#), [Y. Nakajima](#), [M. R. Vagins](#), [H. Ito](#), [Y. Takaku](#), [Y. Tanaka](#), [Y. Yamaguchi](#)

**Abstract:** ...evaluate its quality. Because of the long measurement time of HPGe detectors, we have employed several underground laboratories for making parallel measurements including LSC in **Spain**, Boulby in the UK, and Kamioka in Japan. In the first half of production, the measured batch purities were found to be consistent with the specifications. However, in the latter... [▽ More](#)

Submitted 13 September, 2022; **originally announced** September 2022.

**Comments:** 32 pages, 9 figures

45. [arXiv:2209.06722](#) [pdf, other] cs.CR cs.LO

## Detection of Smart Grid Integrity Attacks Using Signal Temporal Logic

Authors: [José Ignacio Requeno](#)

**Abstract:** Cyber-attacks can have severe impacts on critical infrastructures, from outages to economical loss and physical damage to people and environment. One of the main targets of these attacks is the smart grid. In this paper, we propose a new software detector for integrity attacks targeting smart meter readings. The detector relies upon mining parameters of temporal logic specifications for integrity... [▽ More](#)

Submitted 16 September, 2022; v1 submitted 14 September, 2022; originally announced September 2022.

Comments: Editor: Geert Deconinck. 18th European Dependable Computing Conference (EDCC 2022), September 12-15, 2022, Zaragoza, Spain. Fast Abstract Proceedings - EDCC 2022

46. [arXiv:2209.05380](#) [pdf, ps, other] hep-ph hep-ex nucl-ex nucl-th

## Accessing GPDs through the exclusive photoproduction of a $\gamma$ -meson pair

Authors: [Goran Duplanić](#), [Saad Nabeebaccus](#), [Kornelija Passek-Kumerički](#), [Bernard Pire](#), [Lech Szymanowski](#), [Samuel Wallon](#)

**Abstract:** We consider the exclusive photo-production of a photon-meson pair with a large invariant mass, working in the QCD factorisation framework. Explicitly, we consider a  $\rho$ -meson or a charged  $\pi$  in the final state. This process gives access both to chiral-even GPDs and chiral-odd GPDs, which are not well-known experimentally, especially the latter ones. The computation is performed at leading order... [▽ More](#)

Submitted 21 September, 2022; v1 submitted 12 September, 2022; originally announced September 2022.

Comments: 6 pages, 3 figures. Presented by S. Nabeebaccus at DIS2022: XXIX International Workshop on Deep-Inelastic Scattering and Related Subjects, Santiago de Compostela, Spain, May 2-6 2022

47. [arXiv:2209.05077](#) [pdf, other] cs.CV eess.IV

## BON: An extended public domain dataset for human activity recognition

Authors: [Girmaw Abebe Tadesse](#), [Oliver Bent](#), [Komminist Weldemariam](#), [Md. Abrar Istiak](#), [Taufiq Hasan](#), [Andrea Cavallaro](#)

**Abstract:** ...paper provides details of a large and publicly available office activity dataset (BON) collected in different office settings across three geographical locations: Barcelona (Spain), Oxford (UK) and Nairobi (Kenya), using a chest-mounted GoPro Hero camera. The BON dataset contains eighteen common office activities that can be categorised into person-to-person... [▽ More](#)

Submitted 12 September, 2022; originally announced September 2022.

48. [arXiv:2209.01166](#) [pdf, other] astro-ph.IM astro-ph.GA doi [10.1117/12.2627132](#)

## Calibration at elevation of the WEAVE fibre positioner

Authors: [Sarah Hughes](#), [Gavin Dalton](#), [Kevin Dee](#), [Don Carlos Abrams](#), [Kevin Middleton](#), [Ian Lewis](#), [David Terrett](#), [Alfonso L. Aguerri](#), [Marc Balcells](#), [Georgia Bishop](#), [Piercarlo Bonifacio](#), [Esperanza Carrasco](#), [Scott Trager](#), [Antonella Vallenari](#)

**Abstract:** WEAVE is the new wide-field spectroscopy facility for the prime focus of the William Herschel Telescope in La Palma, Spain. Its fibre positioner is essential for the accurate placement of the spectrograph's 960 fibre multiplex. We provide an overview of the recent maintenance, flexure modifications, and calibration measurements conducted at the observato... [▽ More](#)

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Comments: 16 pages, 16 figures

Journal ref: Ground-based and Airborne Instrumentation for Astronomy IX 12184 (2022) 121846J

49. [arXiv:2209.01145](#) [pdf, other] astro-ph.IM astro-ph.GA doi [10.1117/12.2627132](#)

## Optimisation of the WEAVE target assignment algorithm

Authors: [Sarah Hughes](#), [Gavin Dalton](#), [Daniel Smith](#), [Kenneth Duncan](#), [David Terrett](#), [Don Carlos Abrams](#), [J. Alfonso Aguerri](#), [Marc Balcells](#), [Georgia Bishop](#), [Piercarlo Bonifacio](#), [Esperanza Carrasco](#), [Shoko Jin](#), [Ian Lewis](#), [Scott Trager](#), [Antonella Vallenari](#)

**Abstract:** WEAVE is the new wide-field spectroscopic facility for the prime focus of the William Herschel Telescope in La Palma, Spain. Its fibre positioner is essential for the accurate placement of the spectrograph's ~960-fibre multiplex. To maximise the assignment of its optical fibres, WEAVE uses a simulated annealing algorithm called Configure, which allocates... [▽ More](#)

Submitted 2 September, 2022; originally announced September 2022.

Comments: 19 pages, 17 figures

Journal ref: Ground-based and Airborne Instrumentation for Astronomy IX 12184 (2022) 121846J

## A Musical Serious Game for Social Interaction through Augmented Rhythmic Improvisation

**Authors:** [Filippo Carnovalini](#), [Antonio Rodà](#), [Paolo Caneva](#)

**Abstract:** Making music with other people is a social activity as well as an artistic one. Music therapists take advantage of the social aspects of music to obtain benefits for the patients, interacting with them musically, but this activity requires an high level of expertise. We propose a serious game that helps people even without musical skills interact with each other by collaboratively creating a rhythm... [▽ More](#)

**Submitted** 31 August, 2022; **originally announced** August 2022.

**Journal ref:** ), September 25--27, 2019, Valencia, [Spain](#). ACM, New York, NY, USA, 6 pages

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